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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,679	12/18/2001	Alfred E. Keller	1856-09301 (99/026)	2932

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EXAMINER	
VANOY, TIMOTHY C	
ART UNIT	PAPER NUMBER
1754	9

DATE MAILED: 06/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

MK-9

Office Action Summary

Application No.	Applicant(s)	
10-024,679	KELLER et al.	
Examiner	Group Art Unit	
VANOY	1754	

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

A TIME LIMIT OF ONE MONTH IS SET TO REMEDY THE DEFICIENCIES OF THE IDS.

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-40 is/are pending in the application.

Of the above claim(s) 31-35 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-30 AND 36-40 is/are rejected.

☒ Claim(s) 4 is/are objected to.

☒ Claim(s) 1-40 are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☒ The specification is objected to by the Examiner.

☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☒ Other INFORMATION REGARDING IRRADIATED MAIL

Office Action Summary

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-30 and 36-40 (group I), drawn to a process for converting hydrogen sulfide into elemental sulfur, classified in class 423, subclass 573.1+.

II. Claims 31-36 (group II), drawn to a process for converting hydrogen sulfide into elemental sulfur and for a method for preparing a catalyst, classified in class 423, subclass 573.1+ and also class 502, subclass 439+.

The inventions are distinct, each from the other, because the inventions set forth in claims 1-30 and 36-40 (group I) and claims 31-35 (group II) are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the claims set forth in groups I and II fall under the combination-subcombination type "AB_{br}/B_{sp} Restriction Proper" category set forth in section 806.05(C)(I) in the MPEP (Aug. 2001) in as much as the B_{br} corresponds to the "catalyst device" of claim 1 and the B_{sp} corresponds to the method by which the "catalyst device"

of claim 1 was made. The subcombination has separate utility such as the method for preparing the "catalyst device" of claim 1 which is set forth in claim 31, and this claimed method for preparing the catalyst device does not require the particulars of using the catalyst device set forth in claim 1 to support its own patent.

Because these inventions are distinct for the reasons given above and the claims set forth in groups I and II have acquired a separate status in the art as shown by their different classification, and the claims set forth in groups I and II have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Ms. Carol Mintz, applicants' attorney, on June 20, 2003, a provisional election was made with traverse to prosecute the invention of the process for converting hydrogen sulfide into elemental sulfur, claims 1-30 and 36-40 (group I). Affirmation of this election must be made by the applicants in their reply to this Office action. Claims 31-35 (group II) are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The Applicants are reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be

accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Information Disclosure Statement

The information disclosure statement date-stamped July 24, 2002 does not fully comply with the requirements of 37 CFR 1.98 because the literature references by Watson et al.; Gamson et al. and the PCT search report for PCT/US01/148795 (?) are missing. Since the submission appears to be *bona fide*, applicant is given **ONE (1) MONTH** from the date of this notice to supply the above mentioned omissions or corrections in the information disclosure statement. NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b). Failure to timely comply with this notice will result in the above mentioned information disclosure statement being placed in the application file with the noncomplying information **not** being considered. See 37 CFR 1.97(i).

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

This application presents a claim for subject matter not originally claimed or embraced in the statement of the invention. Pg. 1 in the specification sets forth that this application is a continuation-in-part of 09-742,999. A supplemental oath or declaration

is required under 37 CFR 1.67. The new oath or declaration must properly identify the application of which it is to form a part, preferably by application number and filing date in the body of the oath or declaration. See MPEP §§ 602.01 and 602.02.

Additionally, it would seem that the oath should also set forth that priority is also claimed of the parent applications 60-146,635 and also 09-625,710.

Specification

a) On pg. 18, paragraph no. 0048, pg.s 19 and 26 and also on pg. 31 ln. 2, the status of 09-742,999 and 09-625,710 should be updated.

b) On pg. 30 paragraph no. 0073, the complete application information should be provided for the docket no. 1856-09501.

The entire specification should be reviewed to ensure that all application serial numbers are complete, accurate and updated.

Claim Objections

a) In claim 4, the phrase ". . . in a reaction zone comprises in a millisecond contact time reactor. . ." is grammatically incorrect.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as their invention.

a) Claim 2 and 4 do not particularly point out and distinctly set forth what the "desired gaseous product" is. The metes and bounds of "desired gaseous product" have not been provided in claims 2 and 4.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having "ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. The Applicants are advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-20, 23, 29, 30 and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 5,654,491 in view of pg. 1 paragraph no. 0003 in the applicants' specification and WO 97/19019.

U. S. Pat. 5,654,491 discloses a process for partially oxidizing natural gas (please see col. 1 lns. 22-25), comprising the steps:

Passing the gas through a catalyst (such as Pt and Rh supported on gauze: please see claims 1, 2 and 6) for a time that is no greater than 1,000 milliseconds (please see claim 1) at a temperature of at least 700 °C (please see col. 6 lns. 52-55) together with oxygen to produce a gas comprising carbon monoxide (please also see claim 10).

The difference between the applicants' claims and U. S. Pat. 5,654,491 is that the applicants' claims call for the hydrogen sulfide present in the gas stream to be oxidized into elemental sulfur.

Pg. 1 parag. No. 0003 in the applicants' specification reports that natural gas (i. e. the same gas stream that the process of U. S. Pat. 5,654,491 treats: please also see col. 1 lns. 22-25 in U. S. Pat. 5,654,491) is contaminated with hydrogen sulfide.

WO 97/19019 discloses a process for the oxidation of hydrogen sulfide into elemental sulfur by passing the hydrogen sulfide-contaminated gas through a catalyst a variety of catalytic metals wherein the catalytic metals are supported on a silicon carbide support. The advantages of using a silicon carbide support are reported to be the resistance to sulfation and the avoidance of combustion (please see pg. 3 lns. 23-26 in WO 97/19019). Pg. 2 lns. 8-30 and pg. 4 lns. 13-18 in WO 97/19019 gives examples of the catalytic metals that may be used to promote the oxidation of the hydrogen sulfide into elemental sulfur (to include the Pt and Rh expressly mentioned in col. 9 lns. 31 in U. S. Pat. 5,654,491).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further describe the process of U. S. Pat. 5,654,491 as promoting the oxidation of the hydrogen sulfide that is inherently present in the natural gas feedstock that the process of U. S. Pat. 5,654,491 treats (as evinced by the disclosure set forth on pg. 1 paragraph no. 0003 in the applicants' disclosure), in the manner required by the applicants' claims, because the disclosure set forth on at least pg. 21 ln. 11 in WO 97/19019 is evidence that the Pt and Rh of U. S. Pat. 5,654,491 will inherently promote the oxidation of the hydrogen sulfide that is inherently present in the natural gas feedstock that the process of U. S. Pat. 5,654,491 treats.

The difference between the applicants' independent claim 1 and the process of U. S. Pat. 5,654,491 is that the applicants' claim 1 also calls for the additional step of passing the resulting elemental sulfur-containing gas through a cooler at a temperature that is lower than the dew point of sulfur, however it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made because of the necessity of condensing and removing the elemental sulfur out of the gas that would have otherwise escaped out and into either the atmosphere or other downstream processing equipment.

Claims 1-30 and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 5,654,491 in view of pg. 1 paragraph no. 3 and WO 97/19019 as applied to claims 1-20, 23, 29, 30 and 36-40 above, and further in view of U. S. Pat. 6,099,819.

The difference between the applicants' claims and U. S. Pat. 5,654,491 is that applicants' claims 21, 22 and 24 through 28 call for the presence of a lanthanide-based metal (such as lanthanum or samarium) as the catalyst that promotes the oxidation of the hydrogen sulfide into elemental sulfur.

U. S. Pat. 6,099,819 discloses a similar process for the catalytic oxidation of hydrogen sulfide into elemental sulfur by passing the hydrogen sulfide-contaminated gas through a catalyst that may be selected from a variety of rare earth metals to include the La and Sm of the applicants' claims (please see col. 3 ln. 55 to col. 4 ln. 2 in U. S. Pat. 6,099,819).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process resulting from U. S. Pat. 5,654,491 in view of pg. 1 paragraph no. 0003 in the applicants' specification and WO 97/19019 by including the Sm and La described in col. 3 ln. 55 to col. 4 ln. 2 in U. S. Pat. 6,099,819, in the manner required by at least applicants' claims 21, 22 and 24-28, because the disclosure set forth in col. 3 lns. 63-65 in U. S. Pat. 6,099,819 fairly suggests that these rare earth metal catalysts not promote the oxidation of the hydrogen sulfide into elemental sulfur (in the manner required by the applicants' claims), but also have the advantage of avoiding poisoning by hydrogen sulfide.

The following references, which are indicative of the state of the art, are made of record:

U. S. Pat. 6,372,193 B1 disclosing a process for the oxidation of hydrogen sulfide using a catalyst containing a silicon carbide-based support;

U. S. Pat. 6,235,259 B1 disclosing a process for the oxidation of hydrogen sulfide into elemental sulfur;

U. S. Pat. 4,722,799 disclosing a process for desulfurizing natural gas, and

U. S. Pat. 4,197,277 disclosing a process for oxidizing sulfur compounds.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Timothy Vanoy/tv
June 25, 2003

Timothy Vanoy
Patent Examiner

Art Unit 1754

10-024,679

The following papers have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process:

Mailroom Stamp Date Certificate of Mailing Date (MAILED ON AUG. 9 2002)
TRANSMITTAL FORM DATE-STAMPED AUG. 15, 2002 (PAPER # 7)
TRANSMITTAL FORM MAILED ON JULY 18 2002
INFORMATION DISCLOSURE STATEMENT DATED JULY 18, 2002
TRANSMITTAL FORM MAILED ON AUG. 9 2002 AND IDS DATED AUG. 8 2002
TRANSMITTAL FORM MAILED ON JULY 25 2002 AND IDS DATED JULY 25 2002
TRANSMITTAL FORM MAILED ON MAR. 18 2002

The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS
ORIGINALLY FILED

If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents. If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

PART OF PAPER No. 9

INFORMATION REGARDING IRRADIATED MAIL